

$$y = mx + b$$

Slope-Intercept Form

$$m = \frac{\text{Rise}}{\text{Run}} \quad (0, b)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

A. First Solve Graphically using the Slope-Intercept Form or Standard Form

B. Then Solve using Substitution or Elimination

1.
$$\begin{cases} \text{Equation 1} & y = -3x + 5 \\ \text{Equation 2} & -2x + y = -10 \end{cases} \quad (3, -4)$$

Plot the line using the y-intercept (0, y) and the slope, m.

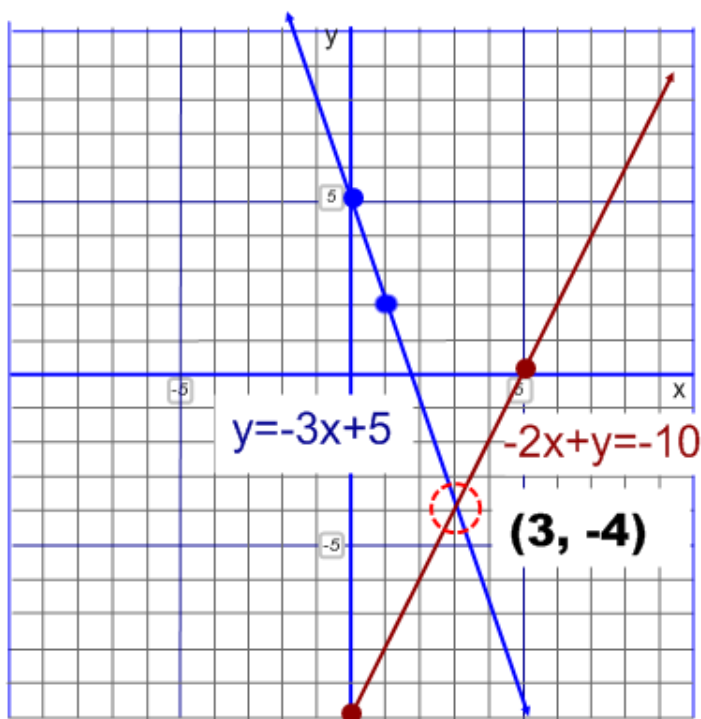
$$y = mx + b$$

$$y = -3x + 5$$

Explain: Start at (0, 5) the y-intercept, then use the slope to find the next point

$$m = -3 = \frac{-3}{1}$$

go down by three and over by 1.



Plot the line using the x-intercept (x, 0) & y-intercept (0, y)

$$Ax + By = C$$

$$-2x + y = -10$$

Explain: Use the y-intercept, (0, y) substitute the x=0 in equation 2.

$$2 \cdot 0 + y = -10$$

Two times zero is zero!, Therefore..

$$y = -10$$

and the y-intercept is (0, -10).

Now use the x-intercept, (x, 0)

$$-2x + y = -10$$

substitute the y=0 in equation 2.

$$2x + 0 = -10$$

$$-2x = -10$$

$$x = 5$$

and the x-intercept is (5, 0).

Substitute Equation 1 into Equation 2

$$\begin{cases} \text{Equation 1} & y = -3x + 5 \\ \text{Equation 2} & -2x + y = -10 \end{cases}$$

$$-2x + (-3x + 5) = -10$$

$$-5x + 5 = -10 \quad \text{simplify \& then solve}$$

$$-5x = -15$$

$$x = 3$$

Substitute this value x=3 into equation 1

$$y = -3 \cdot (3) + 5$$

$$y = -9 + 5$$

$$y = -4$$

$$(3, -4)$$

is the solution to both equations